

5 **We claim**

1. A direct display portable device for measurement of gossypol concentration after colour development, said apparatus comprising:
 - a) a light source for emitting light of specific wavelength,
 - b) a means to control intensity of light from the light source,
 - 10 c) a glass cuvette for holding the test sample through which the light is passed,
 - d) a cuvette sample holder for holding the glass cuvette,
 - e) a photo detector for detecting the light transmitted by test sample,
 - f) a means to convert the output current signal from the photo detector to voltage,
 - 15 g) a log amplifier for amplifying the output signal of the converter,
 - h) a calibration circuit enabling display on a display unit, and
 - i) a power supply for supplying power to different components of the device.
2. The device as claimed in claim 1, wherein gossypol is selected from the group consisting of deoiled cake, cottonseed and cottonseed oil.
- 20 3. The device as claimed in claim 1, wherein the determination of the concentration of the gossypol concentration is in milligram / litre and parts per million (ppm) in the display unit of atleast 3½ digit display.
4. The device as claimed in claim 1, wherein the light source is an LED of 5 mm having intensity of 125 mcd, view angle of 24°, peak wavelength of 635 nm and power dissipation of 50 mW.
- 25 5. The device as claimed in claim 1, wherein the means used to control the intensity of light from LED is a multiturn potentiometer to get 100 % transmittance (0% absorbance) of light through distilled water in the cuvette.
6. The device as claimed in claim 1, wherein the cuvette used is made up from Borosil glass.
- 30 7. The device as claimed in claim 1, wherein path length of the glass cuvette is of 17 mm.
8. The device as claimed in claim 1, wherein the cuvette used is screw capped having a diameter of 17 mm, height of 5 cm and capacity of 6 ml.
- 35 9. The device as claimed in claim 1, wherein cuvette holder is made up from aluminium alloy, which is blackened.

- 5 10. The device as claimed in claim 1, wherein the photo detector BPW 21 having package of TO 5, effective area of detection of 5.9 mm diameter wavelength range of 460-750 nm and sensitivity of 7nA/lux is used to detect the transmitted / absorbed light through the test solution.
11. The device as claimed in claim 1, wherein the current to voltage converter produces
10 voltage which is directly proportional to current flowing through the converter, which inturn is proportional to the light intensity falling on the detector.
12. The device as claimed in claim 1, wherein the means to convert the current signal to voltage signal is a current/voltage converter.
13. The device as claimed in claim 1, wherein the log amplifier is TL 441 IC.
- 15 14. The device as claimed in claim 1, wherein the calibration circuit is a 10 K POT and after log amplification, voltage output is calibrated in terms of gossypol concentration in the test solution.
15. The device as claimed in claim 1, wherein the power supply is a 6-Volt battery for the log amplifier, photo detector and other integrated chips and a 9-Volt supply for the
20 display unit.
16. The device as claimed in claim 1, wherein the results are displayed on the display unit.
17. The device as claimed in claim 1, wherein the results are displayed on computer through CC+ large.
- 25 18. The device as claimed in claim 1, wherein a software VISIDAQ is used for data acquisition, calculation and control application.
19. The device as claimed in claim 1, wherein the present device is based on Lambert Beer 's Law.
20. The device as claimed in claim 1 is low cost, portable, rugged and measures
30 gossypol in the range of $\pm 2\%$ error.